FIG 1

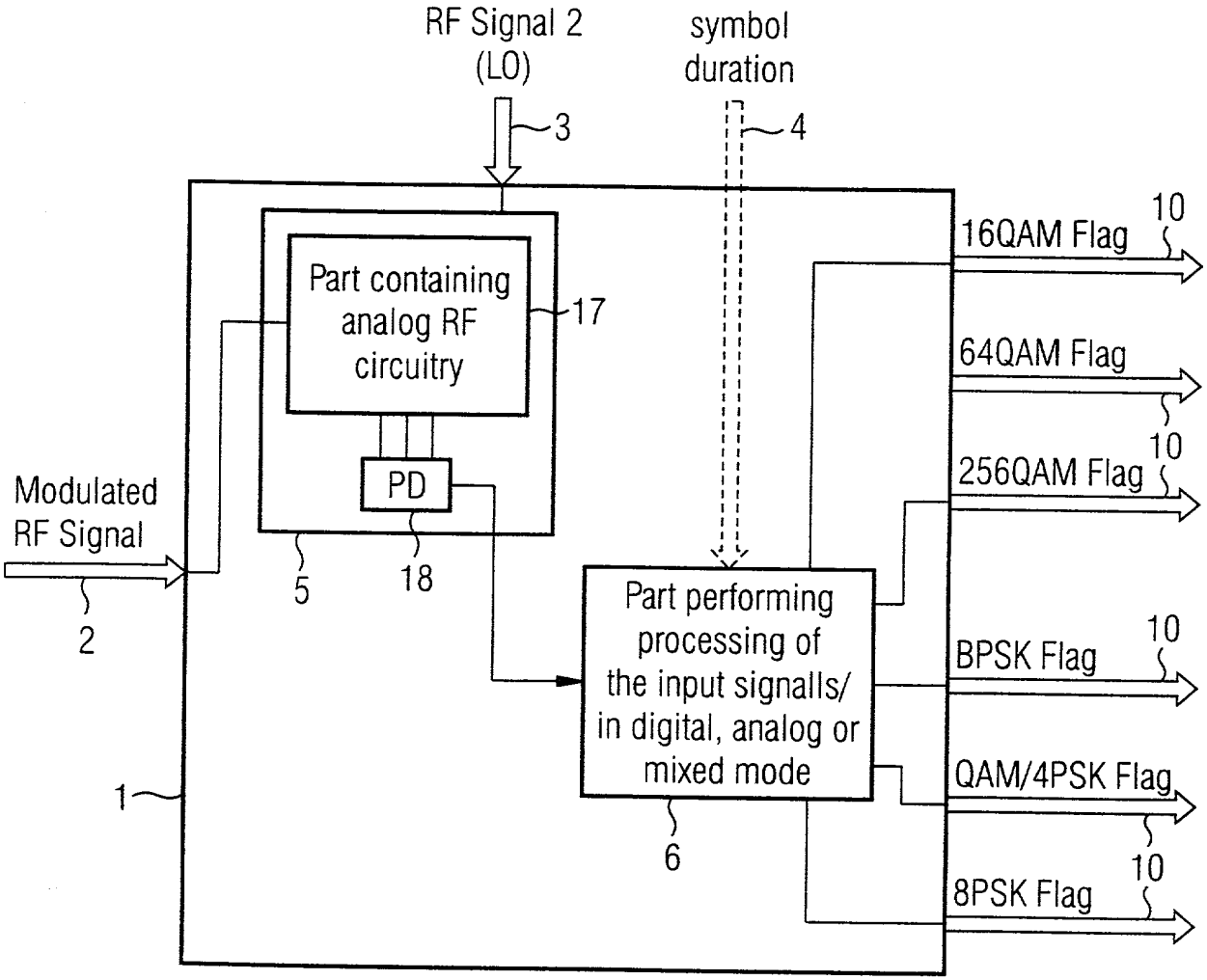

RF Signal 2
(LO)
3
symbol
duration
4
Part containing
analog RF
circuitry
17
PD
18
5
Modulated
RF Signal
2
1
Part performing
processing of
the input signalls/
in digital, analog or
mixed mode
6
16QAM Flag
10
64QAM Flag
10
256QAM Flag
10
BPSK Flag
10
QAM/4PSK Flag
10
8PSK Flag

FIG 2

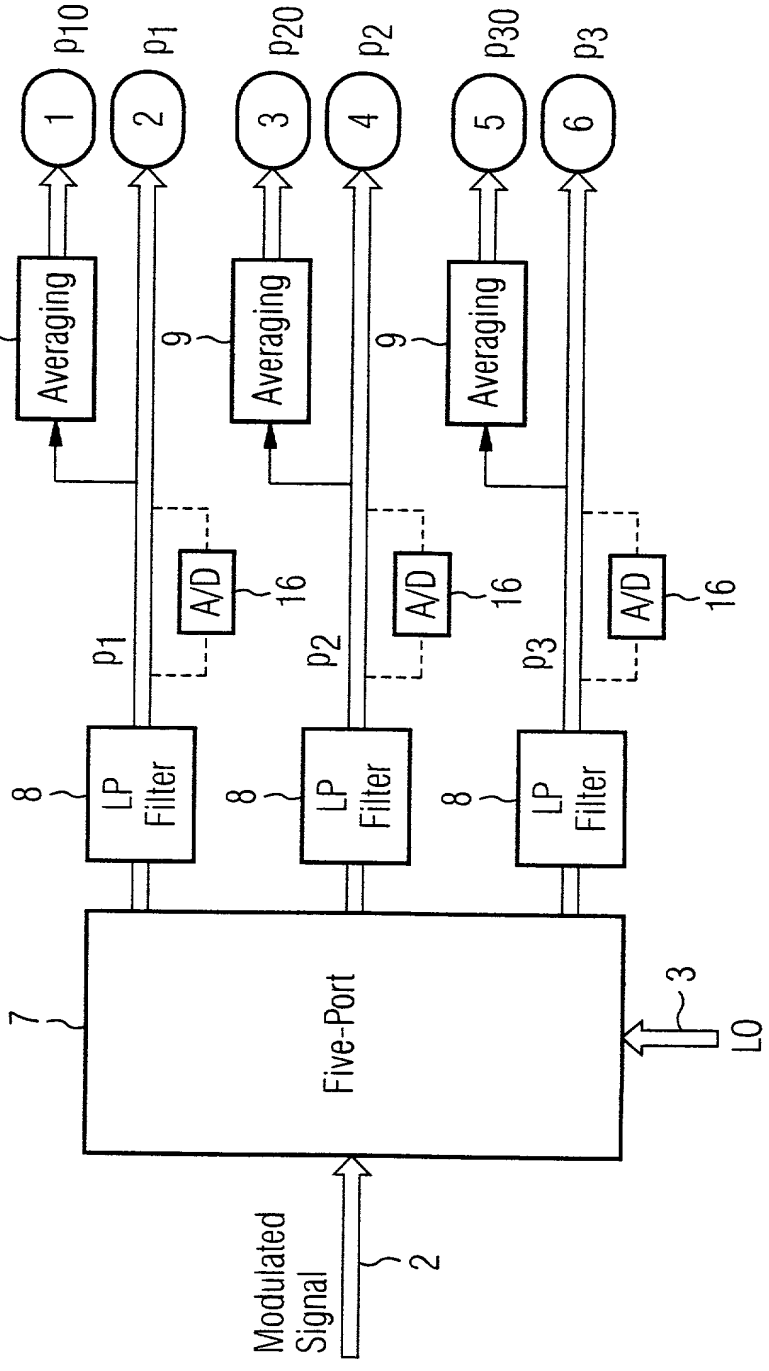

Modulated Signal
2
7
Five-Port
3
LO
8
LP Filter
8
LP Filter
8
LP Filter
p1
p2
p3
A/D
16
A/D
16
A/D
16
9
Averaging
9
Averaging
9
Averaging
1
p10
2
p1
3
p20
4
p2
5
p30
6
p3

FIG 3

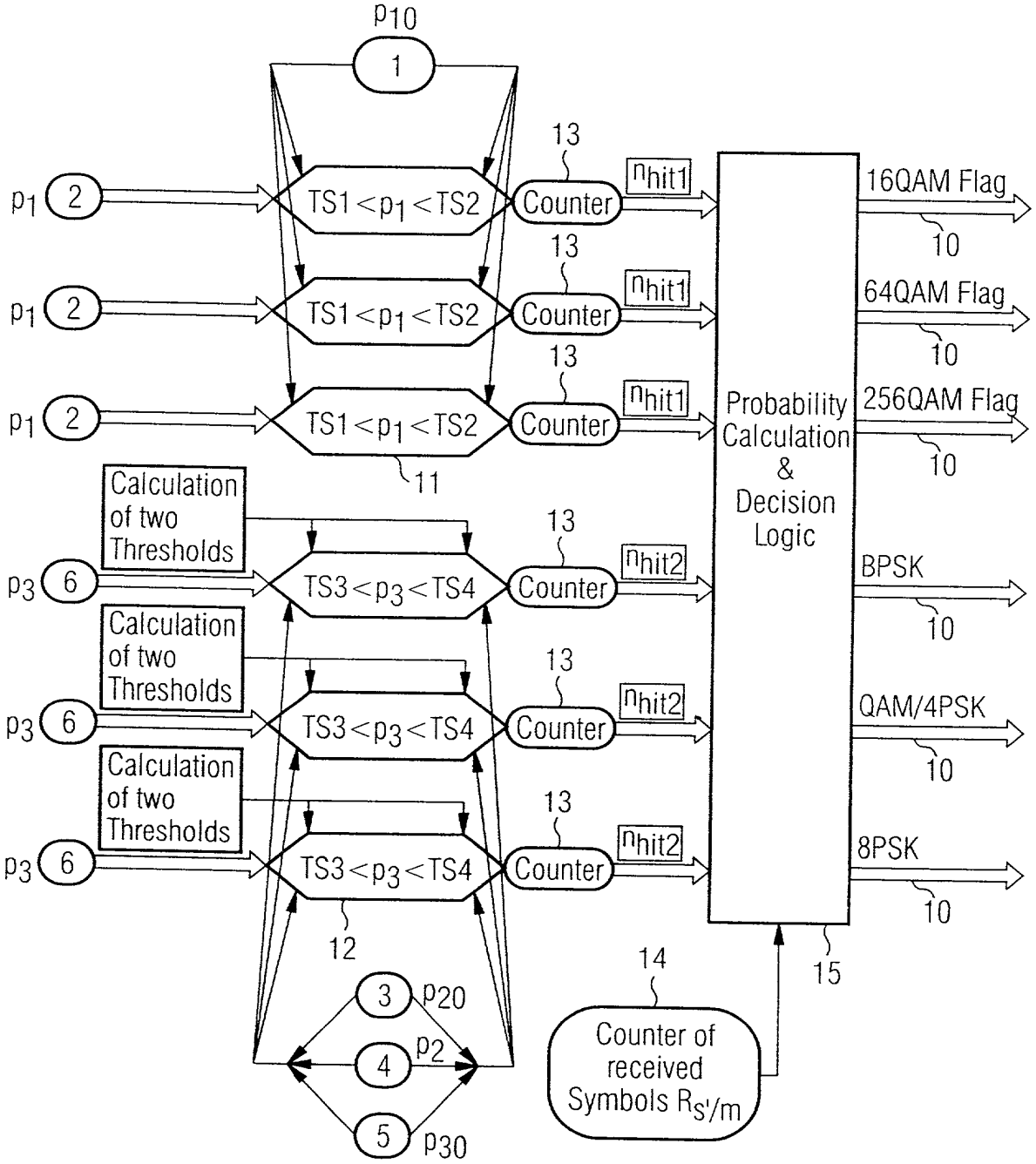

p10
1
p1
2
TS1<p1<TS2
Counter
13
nhit1
16QAM Flag
10
64QAM Flag
256QAM Flag
Probability Calculation & Decision Logic
11
Calculation of two Thresholds
p3
6
TS3<p3<TS4
nhit2
BPSK
QAM/4PSK
8PSK
12
3
p20
4
p2
5
p30
14
Counter of received Symbols Rs'/m
15

FIG 4

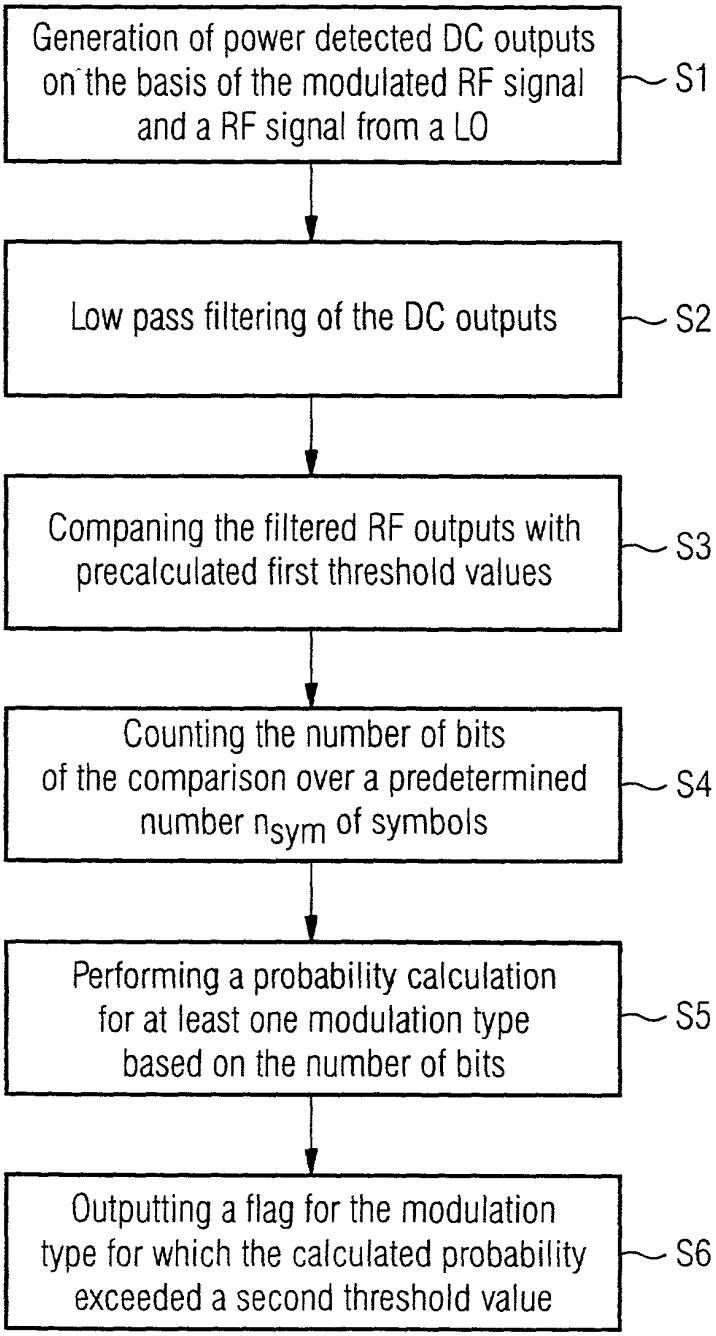

Generation of power detected DC outputs on the basis of the modulated RF signal and a RF signal from a LO
S1
Low pass filtering of the DC outputs
S2
Companing the filtered RF outputs with precalculated first threshold values
S3
Counting the number of bits of the comparison over a predetermined number n_{sym} of symbols
S4
Performing a probability calculation for at least one modulation type based on the number of bits
S5
Outputting a flag for the modulation type for which the calculated probability exceeded a second threshold value
S6

FIG 5a

64QAM		16QAM	
I/Ī+Q/Q̄i	p_1/p_{10}	I/Ī+Q/Q̄i	p_1/p_{10}
0.2500+0.2500i	0.0476	0.5000+0.5000i	0.2000
0.2500+0.7500i	0.2381	0.5000+1.5000i	1.0000
0.2500+1.2500i	0.6190	1.5000+0.5000i	1.0000 (r_2)
0.2500+1.7500i	1.1905	1.5000+1.5000i	1.8000 (r_1)
0.7500+0.2500i	0.2381		
0.7500+0.7500i	0.4286		
0.7500+1.2500i	0.8095		
0.7500+1.7500i	1.3810		
1.2500+0.2500i	0.6190		
1.2500+0.7500i	0.8095		
1.2500+1.2500i	1.1905		
1.2500+1.7500i	1.7619		
1.7500+0.2500i	1.1905		
1.7500+0.7500i	1.3810		
1.7500+1.2500i	1.7619 (r_2)		
1.7500+1.7500i	2.3333 (r_1)		

FIG 5b

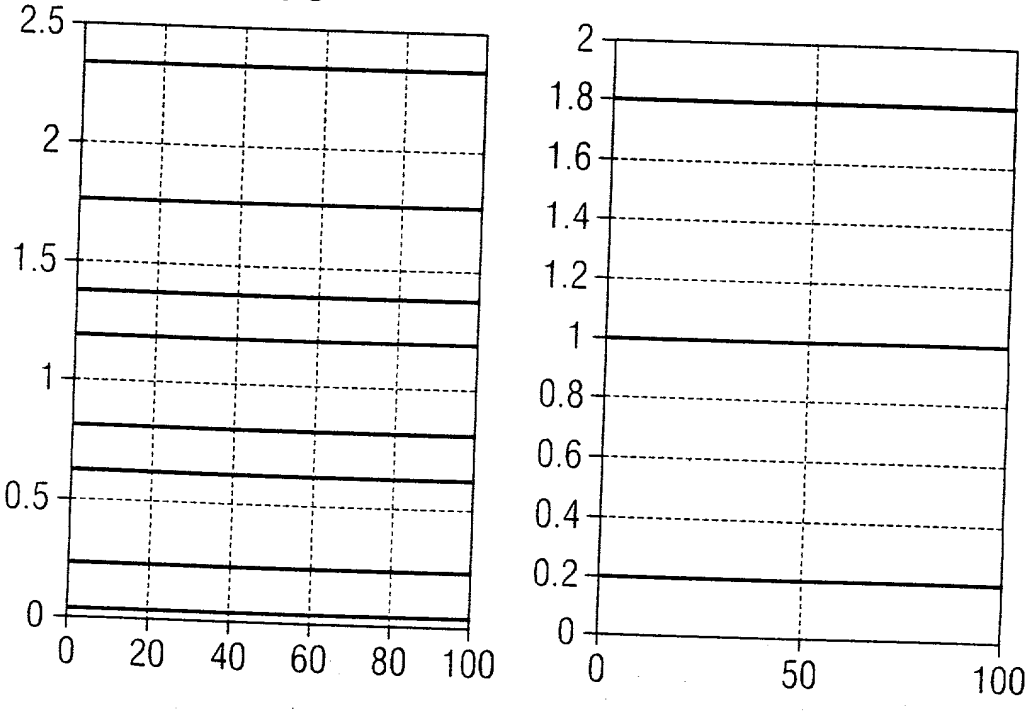


FIG 6

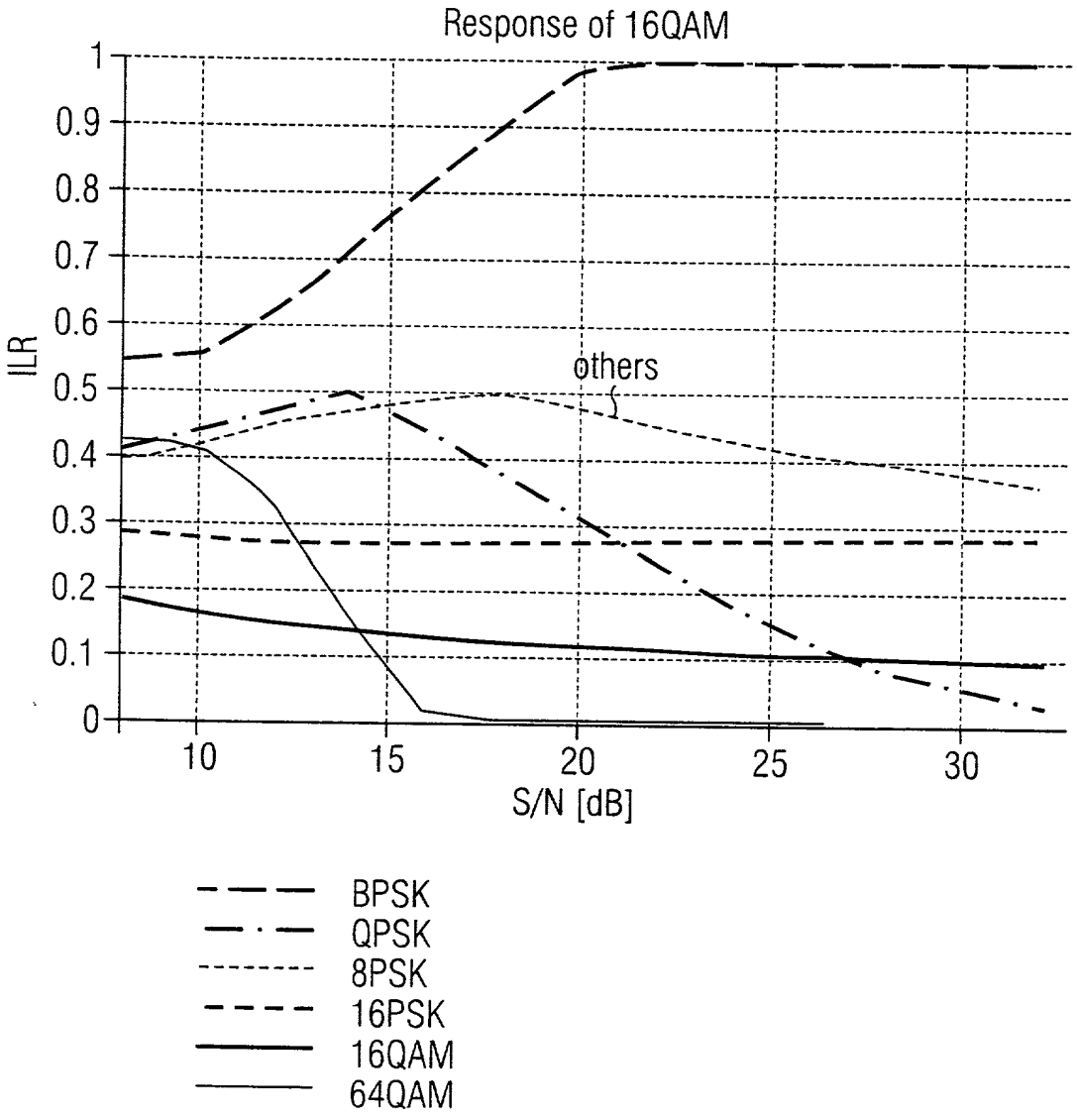
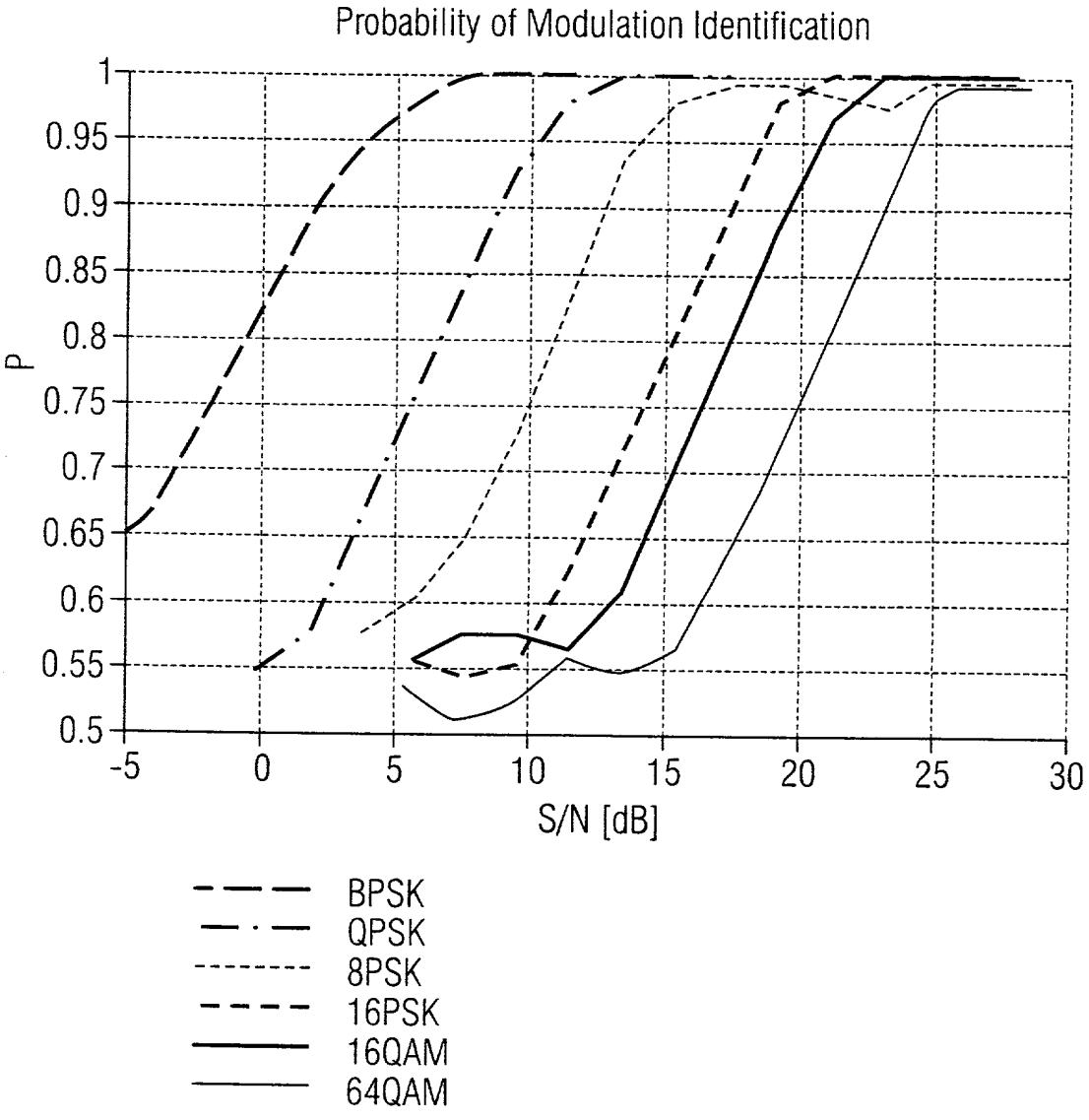

Response of 16QAM
ILR
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
others
10
15
20
25
30
S/N [dB]
BPSK
QPSK
8PSK
16PSK
16QAM
64QAM

FIG 7


Probability of Modulation Identification
P
1
0.95
0.9
0.85
0.8
0.75
0.7
0.65
0.6
0.55
0.5
-5
0
5
10
15
20
25
30
S/N [dB]
BPSK
QPSK
8PSK
16PSK
16QAM
64QAM